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SUBSTANTIALLY DRY CLEANSING PRODUCT OF IMPROVED LATHERABILITY ;

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ABSTRACT:

A disposable single use substantially dry cleansing article is disclosed having a lathering surfactant and a fatty acid impregnated into a flexible substrate. Particularly preferred as the fatty acid is stearic acid. The fatty acids are useful as structuring agents and as lathering aids.

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(54) Title: SUBSTANTIALLY DRY CLEANSING PRODUCT OF IMPROVED LATHERABILITY

(57) Abstract: A disposable single use substantially dry cleansing article is disclosed having a lathering surfactant and a fatty acid impregnated into a flexible substrate. Particularly preferred as the fatty acid is stearic acid. The fatty acids are useful as structuring agents and as lathering aids.

SUBSTANTIALLY DRY CLEANSING PRODUCT OF IMPROVED LATHERABILITY

The invention concerns substantially dry, disposable, personal cleansing products. They are constructed of a water insoluble substrate impregnated with lathering surfactants, lathering aids, structurants and optionally skin conditioning agents.

Personal cleansing products have traditionally been marketed in a variety of forms such as bar soaps, creams, lotions, and gels. These formulations have attempted to satisfy a number of criteria to be acceptable to consumers. These criteria include cleansing effectiveness, skin feel, skin mildness and lather volume. Ideal personal cleansers should gently cleanse the skin or hair, cause little or no irritation, and not leave the skin or hair overly dry after frequent use.

A series of granted and pending patent applications have been published by Procter & Gamble describing substantially dry, disposable, personal cleansing products which address many of the aforementioned functionality concerns. These products are substantially dry articles having deposited onto a woven or non-woven cloth a cleansing composition of surfactant, structurant, skin conditioning agent and other performance ingredients.

U.S. Patent 5,951,991 (Wagner et al.) focuses on providing the substrate with a conditioning emulsion separately impregnated from the lathering surfactant onto the cloth

substrate. U.S. Patent 5,980,931 (Fowler et al.) emphasises impregnation of oil soluble conditioning agents. WO 99/55303 (Albacarys et al.) describes skin care actives formulated with the cleansing composition. Manufacturing processes for these products are reported in U.S. Patent 5,952,043 and U.S. Patent 5,863,663, both to Mackey et al. These patents teach use of a continuous lipid phase with a high melting waxy material deposited onto the wipe substrate. The waxy material is intended to be sufficiently brittle so as to be easily disrupted by low shear contact (e.g. during wiping of the skin) to readily release an internal skin conditioning phase, yet the material is required to be sufficiently tough to avoid premature release of the internal phase during the rigors of processing.

A problem with this technology is that through compromise the continuous external lipid phase/internal polar phase is neither sufficiently robust for processing and handling nor sufficiently releasable under wash conditions to allow efficient release of conditioning agent onto the skin. A better structuring and conditioning system has been sought. Moreover, lather volume and quality of these products need improvement.

Accordingly, it is an advantage of the present invention to be able to provide a disposable, substantially dry cleansing product with an improved structurant system.

Another advqantage of the present invention is to be able to provide a disposable, substantially dry cleansing product having a cleansing composition coating on a flexible wiping

cloth wherein the composition adheres without either brittleness or tackiness onto the cloth.

Still another advantage of the present invention is to be able to provide a disposable, substantially dry cleansing product generating a high lather volume with a creamy rich foam.

Yet another advantage of the present invention is to be able to provide a disposable, substantially dry cleansing product that after lathering imparts a good skin feel to the body.

These and other advantages of the present invention will become more apparent in light of the following summary and detailed description.

Thus, according to a first aspect there is provided a disposable, single use personal care cleansing product which includes:

(i) a water insoluble substrate;

(ii) a lathering surfactant; and

(iii) an amount of a C_{12}-C_{24} fatty acid, the lathering surfactant and fatty acid forming a deposited composition impregnated on the substrate; and

wherein the product is substantially dry prior to use.

Now it has been found that fatty acids can adhesively structure lathering surfactants and optionally other components of a cleansing composition onto a delivery wiping cloth. Fatty acids improve hardness and eliminate tackiness

of the deposited composition as compared to previously known systems. Additionally, fatty acids can enhance the richness of the lather and moisturise skin. Cleansing and moisturising properties of the composition are enhanced through use of the fatty acids in conjunction with the water insoluble substrate.

Thus, a major component of compositions according to the present invention is that of a C_{12}-C_{24} fatty acid, particularly a C_{14}-C_{20} fatty acid. Illustrative materials include lauric acid, myristic acid, palmitic acid, oleic acid, linoleic acid, stearic acid, palmitic acid, behenic acid, erucic acid and combinations thereof. Amounts of the fatty acid may range from about 0.01 to about 80%, preferably from about 0.1 to about 50%, more preferably from about 1 to about 30%, optimally from about 5 to about 15% by weight of the deposited composition.

A second essential element of compositions according to the present invention is that of a lathering surfactant. By a "lathering surfactant" is meant a surfactant, which when combined with water and mechanically agitated generates a foam or lather. Preferably, these lathering surfactants should be mild, which means that they must provide sufficient cleansing or detersive benefits but not overly dry the skin or hair, and yet meet the lathering criteria described above.

The products of the present invention typically comprise a lathering surfactant in an amount from about 0.5% to about

40%, preferably from about 0.75% to about 20%, and more preferably from about 1% to about 10%, based on the weight of the deposited composition.

A wide variety of lathering surfactants are useful herein and include those selected from the group consisting of anionic, nonionic, cationic, amphoteric and lathering surfactant mixtures thereof.

Among the anionic lathering surfactants useful herein are the following non-limiting examples which include the classes of:

(1) Alkyl benzene sulfonates in which the alkyl group contains from 9 to 15 carbon atoms, preferably 11 to 14 carbon atoms in straight chain or branched chain configuration. Especially preferred is a linear alkyl benzene sulfonate containing about 12 carbon atoms in the alkyl chain.

(2) Alkyl sulfates obtained by sulfating an alcohol having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms. The alkyl sulfates have the formula $ROSO_3{}^-M^+$ where R is the C_{8-22} alkyl group and M is a mono- and/or divalent cation.

(3) Paraffin sulfonates having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms, in the alkyl moiety. These surfactants are commercially available as Hostapur SAS from Hoechst Celanese.

(4) Olefin sulfonates having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms. Most preferred is sodium C_{14}-C_{16} olefin sulfonate, available as Bioterge AS 40®

(5) Alkyl ether sulfates derived from an alcohol having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms, ethoxylated with less than 30, preferably less than 12, moles of ethylene oxide. Most preferred is sodium lauryl ether sulfate formed from 2 moles average ethoxylation, commercially available as Standopol ES-2®.

(6) Alkyl glyceryl ether sulfonates having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms, in the alkyl moiety.

(7) Fatty acid ester sulfonates of the formula: $R^1CH(SO_3\text{-}M+)CO_2R^2$ where R^1 is straight or branched alkyl from about C_8- to C_{18}, preferably C_{12} to C_{16}, and R^2 is straight or branched alkyl from about C_1 to C_6, preferably primarily C_1, and M+ represents a mono- or divalent cation.

(8) Secondary alcohol sulfates having 6 to 18, preferably 8 to 16 carbon atoms.

(9) Fatty acyl isethionates having from 10 to 22 carbon atoms, with sodium cocoyl isethionate being preferred.

(10) Dialkyl sulfosuccinates wherein the alkyl groups range from 3 to 20 carbon atoms each.

(11) Alkanoyl sarcosinates corresponding to the formula $RCON(CH_3)CH_2CH_2CO_2M$ wherein R is alkyl or alkenyl of about 10 to about 20 carbon atoms and M is a water-soluble cation such as ammonium, sodium, potassium and trialkanolammonium. Most preferred is sodium lauroyl sarcosinate.

(12) Alkyl lactylates wherein the alkyl groups range from 8 to 18 carbon atoms, with sodium lauryl lactylate sold as Pationic 138 C® available from the Patterson Chemical Company as the most preferred.

(13) Taurates having from 8 to 16 carbon atoms, with cocoyl methyl taurate being preferred.

Nonionic lathering surfactants suitable for the present invention include C_{10}-C_{20} fatty alcohol or acid hydrophobes condensed with from 2 to 100 moles of ethylene oxide or propylene oxide per mole of hydrophobe; C_2-C_{10} alkyl phenols condensed with from 2 to 20 moles of alkylene oxides; mono- and di- fatty acid esters of ethylene glycol such as ethylene glycol distearate; fatty acid monoglycerides; sorbitan mono- and di- C_8-C_{20} fatty acids; and polyoxyethylene sorbitan available as Polysorbate 80 and Tween 80® as well as combinations of any of the above surfactants.

Other useful nonionic surfactants include alkyl polyglycosides, saccharide fatty amides (e.g. methyl gluconamides) as well as long chain tertiary amine oxides. Examples of the latter category are: dimethylododecylamine oxide, oleyldi(2-hydroxyethyl)amine oxide, dimethyloctylamine oxide, dimethyldecylamine oxide, dimethyltetradecylamine oxide, di(20-hydroxyethyl)tetradecylamine oxide, 3-didodecyloxy-2-hydroxypropyldi(3-hydroxypropyl)amine oxide, and dimethylhexadecylamine oxide.

Amphoteric lathering surfactants useful for the present invention include aliphatic secondary and tertiary amines, preferably wherein the nitrogen is in a cationic state, in which the aliphatic radicals can be straight or branched chain and wherein one of the radicals contains an ionizable water solubilizing group such as carboxy, sulphonate, sulphate, phosphate or phosphonate. Illustrative substances are cocamidopropyl betaine, cocamphoacetate, cocamphodiacetate, cocamphopropionate, cocamphodipropionate, cocamidopropyl hydroxysultaine, cetyl dimethyl betaine, cocamidopropyl PG-dimonium chloride phosphate, coco dimethyl carboxymethyl betaine, cetyl dimethyl betaine and combinations thereof.

A necessary element of the present invention is that of a water insoluble substrate. By "water insoluble" is meant the substrate does not dissolve or readily break apart upon immersion in water. A wide variety of materials can be used as the substrate. The following non-limiting characteristics are desirable: (i) sufficient wet strength

for use, (ii) sufficient abrasivity, (iii) sufficient loft and porosity, (iv) sufficient thickness, and (v) appropriate size.

Non-limiting examples of suitable insoluble substrates which meet the above criteria include non-woven substrates, woven substrates, hydro-entangled substrates, air entangled substrates and the like. Preferred embodiments employ non-woven substrates since they are economical and readily available in a variety of materials. By non-woven is meant that the layer is comprised of fibres which are not woven into a fabric but rather are formed into a sheet. The fibres can either be random (i.e., randomly aligned) or they can be carded (i.e. combed to be oriented in primarily one direction). Furthermore, the non-woven substrate can be composed of a combination of layers of random and carded fibres.

Non-woven substrates may be comprised of a variety of materials both natural and synthetic. By natural is meant that the materials are derived from plants, animals, insects or by-products. By synthetic is meant that the materials are obtained primarily from various man-made materials or from material that is usually a fibrous web comprising any of the common synthetic or natural textile-length fibres, or mixtures thereof.

Non-limiting examples of natural materials useful in the present invention are silk fibres, keratin fibres and cellulosic fibres. Non-limiting examples of keratin fibres include those selected from the group consisting of wool

fibres, camel hair fibres, and the like. Non-limiting examples of cellulosic fibres include those selected from the group consisting of wood pulp fibres, cotton fibres, hemp fibres, jute fibres, flax fibres, and mixtures thereof. Wood pulp fibres are preferred while all cotton fibres (e.g. cotton pads) are normally avoided.

Non-limiting examples of synthetic materials useful in the present invention include those selected from the group consisting of acetate fibres, acrylic fibres, cellulose ester fibres, modacrylic fibres, polyamide fibres, polyester fibres, polyolefin fibres such as polypropylene fibres, polyvinyl alcohol fibres, rayon fibres and mixtures thereof. Examples of some of these synthetic materials include acrylics such as Acrilan®, Creslan®, and the acrylonitrile-based fiber, Orlon®; cellulose ester fibres such as cellulose acetate, Arnel®, and Acele®; polyamides such as Nylons (e.g., Nylon 6, Nylon 66, Nylon 610 and the like; polyesters such as Fortrel®, Kodel®, and the polyethylene terephthalate fibers, Dacron®; polyolefins such as polypropylene, polyethylene; polyvinyl acetate fibres and mixtures thereof.

Non-woven substrates made from natural materials consist of webs or sheets most commonly formed on a fine wire screen from a liquid suspension of the fibres.

Substrates made from natural materials useful in the present invention can be obtained from a wide variety of commercial

sources. Non-limiting examples of suitable commercially available paper layers useful herein include Airtex®, an embossed airlaid cellulosic layer having a base weight of about 84.9g/m^2 (71 gsy), available from James River Corporation, Green Bay, WI; and Walkisoft®, an embossed airlaid cellulosic having a base weight of about 89.7g/m^2 (75 gsy), available from Walkisoft U.S.A., Mount Holly, NC.

Non-woven substrates made from synthetic material useful in the present invention can also be obtained from a wide variety of commercial sources. Non-limiting examples of suitable non-woven layer materials useful herein include HFE- 40-047, an apertured hydroentangled material containing about 50% rayon and 50% polyester, and having a basis weight of about 51.4g/m^2(43 grams per square yard (gsy)), available from Vertec, Inc., Walpole, MA; HEF 140-102, an apertured hydro-entangled material containing about 50% rayon and 50% polyester, and having a basis weight of about 67.0 g/m^2(56 gsy), available from Veratec, Inc., Walpole, MA; Novenet® 149-191, a thermo-bonded grid patterned material containing about 69% rayon, about 25% polypropylene, and about 6% cotton, and having a basis weight of about 119.6g/m^2 (100 gsy), available from Veratec, Inc., Walpole, MA; HEF Nubtex® 149-801, a nubbed, apertured hydro-entangled material, containing about 100% polyester, and having a basis weight of about 83.7g/m^2(70 gsy), available from Veratec, Inc. Walpole, MA; Keybak® 951V, a dry formed apertured material, containing about 75% rayon, about 25% acrylic fibers, and having a basis weight of about 51.4g/m^2(43 gsy), available

from Chicopee Corporation, New Brunswick, NJ; Keybak® 1368, an apertured material, containing about 75% rayon, about 5% polyester, and having a basis weight of about 46.6g/m^2 (39 gsy), available from Chicopee Corporation, New Brunswick, NJ; Duralace® 1236, an apertured, hydro-entangled material, containing about 100% rayon, and having a basis weight from about 47.8 g/m^2(40 gsy) to about 137.5 g/m^2(115 gsy), available from Chicopee Corporation, New Brunswick, NJ; Duralace® 5904, an apertured, hydro-entangled material, containing about 100% polyester, and having a basis weight from about 47.8g/m^2(40 gsy) to about 137.5 g/m^2(115 gsy), available from Chicopee Corporation, New Brunswick, NJ; Sontaro® 8868, a hydro-entangled material, containing about 50% cellulose and about 50% polyester, and having a basis weight of about 71.8 g/m^2 (60 gsy), available from Dupont Chemical Corp.

Most preferred as a substrate for purposes of this invention are non-woven substrates, especially blends of rayon/polyester and ratios of 10:90 to 90:10, preferably ratios of 20:80 to 80:20, optimally 40:60 to 60:40 by weight. A most useful substrate is a 70:30 rayon/polyester non-woven wipe article.

Anywhere from 1 to 100, preferably from 5 to 50 single wipes may be stored within a dispensing pouch or container, preferably a moisture impermeable pouch or container. During storage and between dispensing, the pouch or container is preferably re-sealable. Single wipe containing pouches may also be employed.

The water insoluble substrates of the present invention may comprise two or more layers, each having similar or different textures and abrasiveness. The differing textures can result from the use of different combinations of materials or from the use of a substrate having a more abrasive side for exfoliation and a softer, absorbent side for gentle cleansing. In addition, separate layers of the substrate can be manufactured to have different colours, thereby helping the user to further distinguish the surfaces.

The amount of deposited composition relative to the substrate may range from about 20:1 to 1:20, preferably from 10:1 to about 1:10 and optimally from about 2:1 to about 1:2 by weight.

A humectant ordinarily is incorporated with compositions of the present invention. Humectants are normally polyols. Representative polyols include glycerin, diglycerin, polyalkylene glycols and more preferably alkylene polyols and their derivatives including propylene glycol, dipropylene glycol, polypropylene glycol, polyethylene glycol and derivatives thereof, sorbitol, hydroxypropyl sorbitol, hexylene glycol, 1,2-butylene glycol, 1,2,6-hexanetriol, isoprene glycol, ethoxylated glycerol, propyoxylated glycerol and mixtures thereof. The most preferred is 2-methyl-1,3-propanediol available as MP Diol from the Arco Chemical Company. Amounts of the polyol may range from about 0.5 to about 95%, preferably from about 1 to about 50%, more preferably from about 1.5 to 20%,

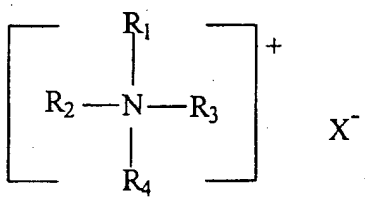
optimally from about 3 to about 10% by weight of the deposited composition.

Impregnating compositions of the present invention may also include silicones of a volatile and non-volatile variety. Typical volatile silicones are the cyclomethicones commercially available as Dow Corning 244, 245, 344 and 345. Linear volatile dimethicones are also suitable. Non-volatile silicones include polydimethyl siloxanes of a viscosity greater than 2 centistoke and silicone copolyols also known as dimethicone copolyol for which Dow Corning 193 is a commercial source. Amounts of the silicones may range from about 0.01 to about 20, preferably from about 0.5 to about 3% by weight of the deposited composition.

Cationic conditioning agents in monomeric and polymeric type are also useful for purposes of this invention. Examples of the polymeric type include: cationic cellulose derivatives, cationic starches, copolymers of a diallyl quaternary ammonium salt and an acryl amide, quaternized vinylpyrrolidone, vinylimidazole polymers, polyglycol amine condensates, quaternized collagen polypeptide, polyethylene imine, cationized silicon polymer (e.g. Amodimethicone), cationic silicon polymers provided in a mixture with other components under the trademark Dow Corning 929 (cationized emulsion), copolymers of adipic acid and dimethylaminohydroxypropyl diethylenetriamine, cationic chitin derivatives, cationized guar gum (e.g. Jaguar C-B-S, Jaguar C-17, Jaguar C-16 and Jaguar C-13 manufactured by the Celanese Company), quaternary ammonium salt polymers (e.g. Mirapol A-15, Mirapol AD-1, Mirapol AZ-1, etc., manufactured

by the Miranol Division of the Rhone Poulenc Company). Most preferred is polyquaternium-11 available as Luviquat® PQ 11 sold by the BASF Corporation.

Examples of monomeric cationic conditioning agents are salts of the general structure:



Wherein R^1 is selected from an alkyl group having from 12 to 22 carbon atoms, or aromatic, aryl or alkaryl groups having from 12 to 22 carbon atoms; R^2, R^3, and R^4 are independently selected from hydrogen, an alkyl group having from 1 to 22 carbon atoms, or aromatic, aryl or alkaryl groups having from 12 to 22 carbon atoms; and X^- is an anion selected from chloride, bromide, iodide, acetate, phosphate, nitrate, sulfate, methyl sulfate, ethyl sulfate, tosylate, lactylate, citrate, glycolate, and mixtures thereof. Additionally, the alkyl groups can also contain ether linkages, or hydroxy or amino group substituents (e.g. the alkyl groups can contain polyethylene glycol and polypropylene glycol moieties). Preferably the anion is phosphate, especially preferred is hydroxy ethyl cetyl dimonium phosphate available as Luviquat® Mono CP from the BASF Corporation.

Amino silicones quats may similarly be employed. Most preferred is Silquat AD designated by the CTFA as Silicone Quaternium 8, available from Siltech Inc.

Amounts of each cationic agent may range from about 0.01 to 5%, preferably from about 0.1 to about 3%, optimally from about 0.3 to about 2.5% by weight of the deposited composition.

The disposable, single use personal care cleansing products of the present invention are manufactured by separately or simultaneously adding onto or impregnating into a water insoluble substrate a lathering surfactant and a fatty acid, wherein the resulting product is substantially dry. By "separately" is meant that the surfactants and fatty acids can be added sequentially, in any order without first being combined together. By "simultaneously" is meant that the surfactants and fatty acids can be added at the same time, with or without first being combined together.

The surfactant, fatty acids and any optional ingredients can be added onto or impregnated into the water insoluble substrate by any means known to those skilled in the art. For example, addition can be through spraying, laser printing, splashing, dipping, soaking, or coating.

When water or moisture is used or present in the manufacturing process, the resulting treated substrate is then dried so that it is substantially free of water. The treated substrate can be dried by any means known to those skilled in the art. Non-limiting examples of known drying

means include the use of convection ovens, radiant heat sources, microwave ovens, forced air ovens, and heated rollers or cams. Drying also includes air drying without the addition of heat energy, other than that present in the ambient environment. Also, a combination of various drying methods can be used.

Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material ought to be understood as modified by the word "about".

The following examples will more fully illustrate the embodiments of this invention. All parts, percentages and proportions referred to herein and in the appended claims are by weight unless otherwise illustrated.

EXAMPLES 1-8

Cleansing articles according to the present invention may have compositions as outlined under Table I. These compositions are placed on a rayon/polyester substrate.

TABLE I

INGREDIENT	EXAMPLE							
	1	2	3	4	5	6	7	8
Hexylene Glycol	15.50	10.50	5.50	25.50	15.50	15.50	15.50	15.50
Stearic Acid	5.00	5.00	5.00	5.00	15.00	5.00	--	1.00
Palmitic Acid	5.00	5.00	5.00	5.00	--	--	15.00	--
PEG 9M	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Decyl Polyglucoside (50% Active)	24.00	30.00	24.00	20.00	24.00	24.00	24.00	24.00
Cocamidopropyl Betaine (82% Active)	17.00	17.00	24.00	13.00	17.00	17.00	17.00	17.00
Sodium Lauroyl Sarcosinate (94% Active)	17.00	17.00	24.00	13.00	17.00	17.00	17.00	17.00
Sodium Lauryl Lactylate	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Luviquat Mono CP (Hydroxyethyl Cetyldimonium Phosphate)	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
Silicone Quaternium 8	1.00	1.00	1.00	1.00	2.00	0.05	0.05	0.05
Luviquat PQ 11 (Polyquaternium 11)	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Fragrance	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Glydant Plus®	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Water	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.

Compositions according to the Table are prepared in the following manner. Hexyleneglycol and fatty acid are mixed together under moderate to vigorous agitation. PEG 9M is dosed to the reactor. Thereafter decyl polyglucoside is added while heating the reactor at 80°C under agitation. Subsequently the betaine, sarcosinate and lactylate are dosed with temperature maintained at 80°C. The resultant composition is cooled to 60°C whereupon the quaternary ammonium salts are blended into the composition. Fragrance and preservatives are folded into the composition after the latter has been cooled to 45°C. A 15.2cm by 20.3cm (six inch by eight inch) rayon/polyester sheet of one gram is then loaded with one gram of the respective compositions. Coated substrates are then dried in an oven.

EXAMPLES 9-17

Additional illustrations of cleansing articles according to the present invention may utilise compositions as outlined under Table II. These compositions are placed on a non-woven polypropylene substrate.

TABLE II

INGREDIENT	EXAMPLE								
	9	10	11	12	13	14	15	16	17
Hexylene Glycol	10.00	10.00	16.00	5.00	5.00	16.00	20.00	16.00	20.00
Polyquaternium-7 (95% Active)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Cocamidopropylbetaine (82% Active)	14.00	17.80	17.80	14.00	10.00	18.00	14.00	17.80	12.90
Decyl Polyglucoside (50% Aqueous)	28.00	35.60	35.60	28.00	20.00	30.00	28.00	35.60	35.60
Sodium C_{12}-Sarcosinate (94% Active)	14.00	17.80	17.80	14.00	10.00	18.00	14.00	17.80	12.90
Sodium Lauryl Lactylate	1.70	1.70	2.00	1.70	1.70	2.00	2.00	1.70	1.70
Silicone Quaternium-8 (40% Active)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Phenonip®	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
C_{12}-C_{15} Alkylbenzoates	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Capric/Caprylic Triglycerides	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Stearic Acid	0.10	1.00	5.00	20.00	30.00	0.10	0.10	0.10	0.10
Sodium Cocoyl Isethionate	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Fragrance	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Water	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.

Compositions according to Table II are prepared in the following manner. Hexylene glycol and fatty acid are mixed together under moderate to vigorous agitation. Decyl polyglucoside is added while heating the reactor at 80°C under agitation. Subsequently the betaine, sarcosinate and lactylate are dosed with temperature maintained at 80°C. The resultant composition is cooled to 60°C whereupon the quaternary ammonium salt is blended into the composition. Fragrance and preservatives and other minor ingredients are folded into the composition after the latter has been cooled to 45°C. A 15.4cm by 20.3cm (six inch by eight inch) non-woven polypropylene sheet of one gram is then loaded with one gram of the respective compositions. Coated substrates are then dried in an oven.

EXAMPLE 18

The following example illustrates benefits achieved by use of fatty acids as structuring agents and lathering aids for the cleansing wipes of the present invention.

Formulations used for these evaluations are listed under Table III.

TABLE III

INGREDIENT	SAMPLE (WEIGHT %)			
	A	B	C	D
Stearic Acid	38.72	--	--	--
Lauric Acid	--	--	38.72	--
Sodium Cocoyl Isethionate	30.28	30.28	30.28	50.00
PEG 8000	23.00	61.72	23.00	37.91
Cocamidopropylbetaine	3.00	3.00	3.00	4.83
Glycerin	2.00	2.00	2.00	3.23
Sunflower Seed Oil	2.00	2.00	2.00	3.23
Fragrance	1.00	1.00	1.00	0.80

Structuring properties of the formulations were evaluated in a test procedure that normally determines hardness of soap bars. The procedure measures the amount of energy or work as a cone penetrates into a sample at a fixed speed. An Instron Model 4501 Universal Testing Instrument was employed for this procedure fitted with appropriate computer software to control the instrument, acquire and transform the data. The instrument was housed in a temperature and relative humidity environment that maintains the consistency of the sample. Values in Table IV correspond to work necessary to penetrate 2 mm at 10 mm/min; averages were of 2 replicates.

TABLE IV

SAMPLE	THICK NEEDLE*	MEDIUM NEEDLE*
A	141.8	35.4
B	165	39.4
C	58.7	15.9
D	70.5	--

* Shaft diameter = 3.886 mm; Angle of taper = 35°; Length of taper = 2.16 mm

** Shaft diameter = 3.175 mm; Angle of taper = 10°; Length of taper = 8.9

Based on the results of the Instron Tests, it is evident that stearic acid was much better at structuring than lauric acid. Sample B which substituted PEG 8000 for stearic acid achieved at least as good structuring as the former material but PEG 8000 has other features which render the substance inappropriate for purposes of this invention. Sample D where stearic acid was replaced on a pro-rated basis by all other ingredients, exhibited a significantly poorer structuring ability.

Lather performance was also evaluated on the samples of Table III applied onto a non-woven substrate. A traditional Lather Volume (Funnel Method) test was employed. The test involved two large sinks and a measuring funnel of 26.7cm (10.5 inch) diameter and a 100 ml graduated cylinder with bottom cleanly removed. Cylinder was fitted with a 0ml mark over the funnel stem. The cylinder was then sealed to the funnel. The procedure involved placing the funnel on the bottom of sink #1. Distilled water was added to the sink until the 0 ml mark of the funnel. Tap water is run into sink #2. A temperature of 40°C is then set.

The sample is held between both hands and completely wetted. Thereafter the sample is squeezed with rotation for ten turns. Lather is then generated by forming the sample into a ball shape and further rotated for 15 half turns. Hands and the sample are removed from under the running water. The sample is then milked by the hands to gather lather for about 10 seconds. A funnel is then placed over the hands

with both being placed into sink #1. When hands are fully immersed, they are slid from under the funnel. The funnel is lowered to the bottom of the sink with lather volume being read

Table V presents results of the lather study based on three replicates for each entry.

TABLE V

SAMPLE	LATHER (1x) VOLUME*	LATHER (5x) VOLUME**
A	87	50
B	123	100
C	0	0
D	168	123

* Initial reading (ml).

** Reading after fifth attempt to generate lather.

Sample A with stearic acid was much better at lathering than Sample C formulated with lauric acid. As expected, the presence of fatty acids degraded latherability. What was unexpected was that the normally better lathering lauric acid was much worse than stearic acid.

The foregoing description and examples illustrate selected embodiments of the present invention. In light thereof variations and modifications will be suggested to one skilled in the art, all of which are within the spirit and purview of this invention.

CLAIMS

1. A disposable, single use personal care cleansing product comprising:

(i) a water insoluble substrate;

(ii) a lathering surfactant; and

(iii) a C_{12}-C_{24} fatty acid, the lathering surfactant and fatty acid forming a deposited composition impregnated on the substrate; and

wherein the product is substantially dry prior to use.

2. The article according to claim 1 wherein the fatty acid is stearic acid.

3. The article according to claim 1 or claim 2 wherein the composition further comprises a quaternary ammonium silicone in an amount from 0.01 to 5% by weight of the deposited composition.

4. The article according to any of the preceding claims wherein the fatty acid is present in an amount from 0.01 to 80% by weight of the deposited composition.

5. The article according to any of the preceding claims wherein the lathering surfactant is present in an amount from 0.5 to 40% by weight of the deposited composition.

6. The article according to any of the preceding claims wherein the water insoluble substrate is a sheet selected from non-woven, woven, hydro-entangled and air entangled substrates.

7. The article according to any of the preceding claims wherein the substrate and the deposited composition are present in the product at a weight ratio from 20:1 to 1:20.

8. The product according to claim 7 wherein the weight ratio ranges from about 2:1 to about 1:2.

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61K7/50 C11D17/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
CHEM ABS Data, EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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P,X	WO 01 08656 A (THE PROCTER & GAMBLE CO.) 8 February 2001 (2001-02-08) claim 1; examples 1,86	1
A	EP 0 870 496 A (KAO CORP.) 14 October 1998 (1998-10-14) examples 23-40	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
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